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Moy

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(54) **BLEEDING MECHANISM FOR USE IN A PROPULSION SYSTEM OF A RECOILLESS, INSENSITIVE MUNITION**

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(22) Filed: **May 13, 2014**

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F41A 1/08 (2006.01)

(52) **U.S. Cl.**
CPC ***F41A 1/08*** (2013.01)

(58) **Field of Classification Search**
CPC F41A 1/08; F41A 1/10
USPC 89/1.7, 1.701–1.706; 102/437, 481
See application file for complete search history.

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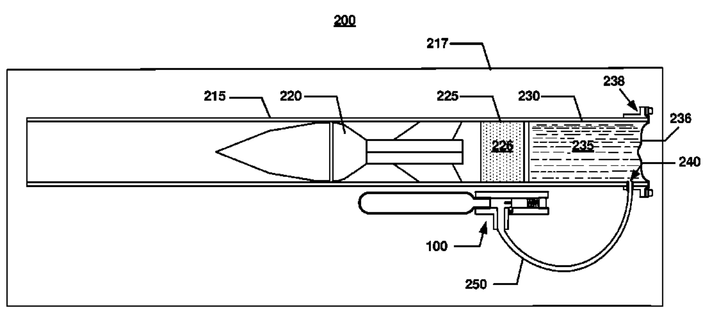
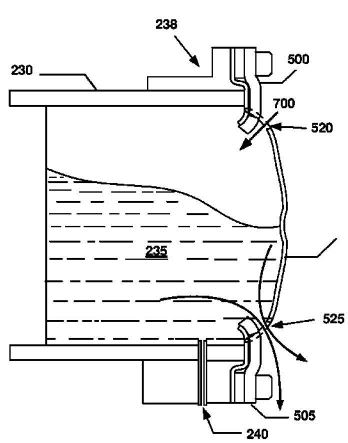
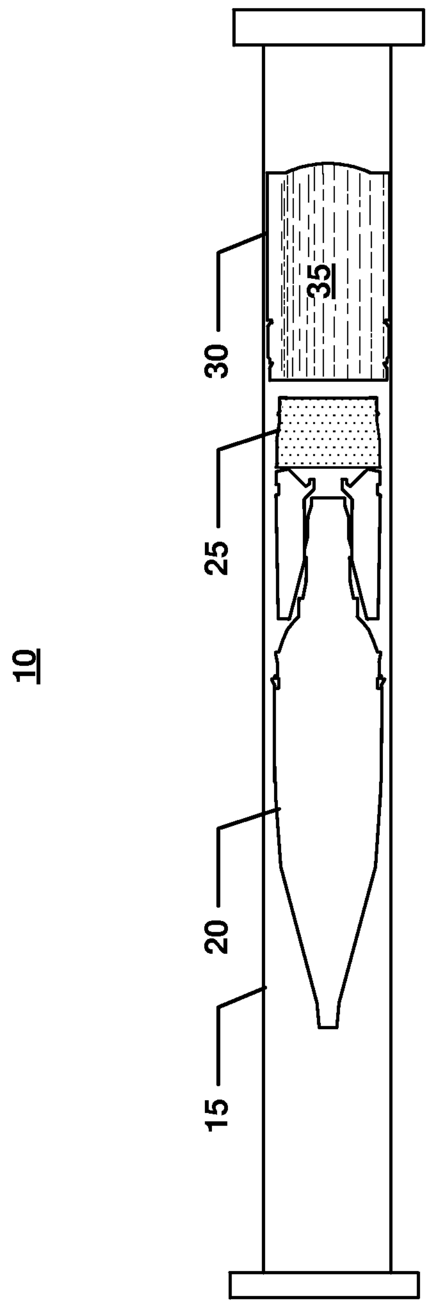
(57) **ABSTRACT**

A bleeding mechanism for use in the propulsion system of a recoilless, insensitive munition utilizing a utilizing a fluidic countermass. The present bleeding mechanism utilizes a firing pin or a similar puncture or tear device. A heat sensitive material blocks the movement of the firing pin. A mechanical locking mechanism locks the firing pin in position until it is unlocked by the melting of the heat sensitive material. When the insensitive munition is exposed to heat, the reaction of the heat sensitive material within the bleeding mechanism allows the firing pin to be released and to rupture a cartridge seal. The cartridge may be filled with a compressed compound, which releases gas under pressure to the countermass container, causing a countermass cover to rupture, thereby emptying the countermass fluid.

20 Claims, 11 Drawing Sheets







(PRIOR ART)
FIG. 1

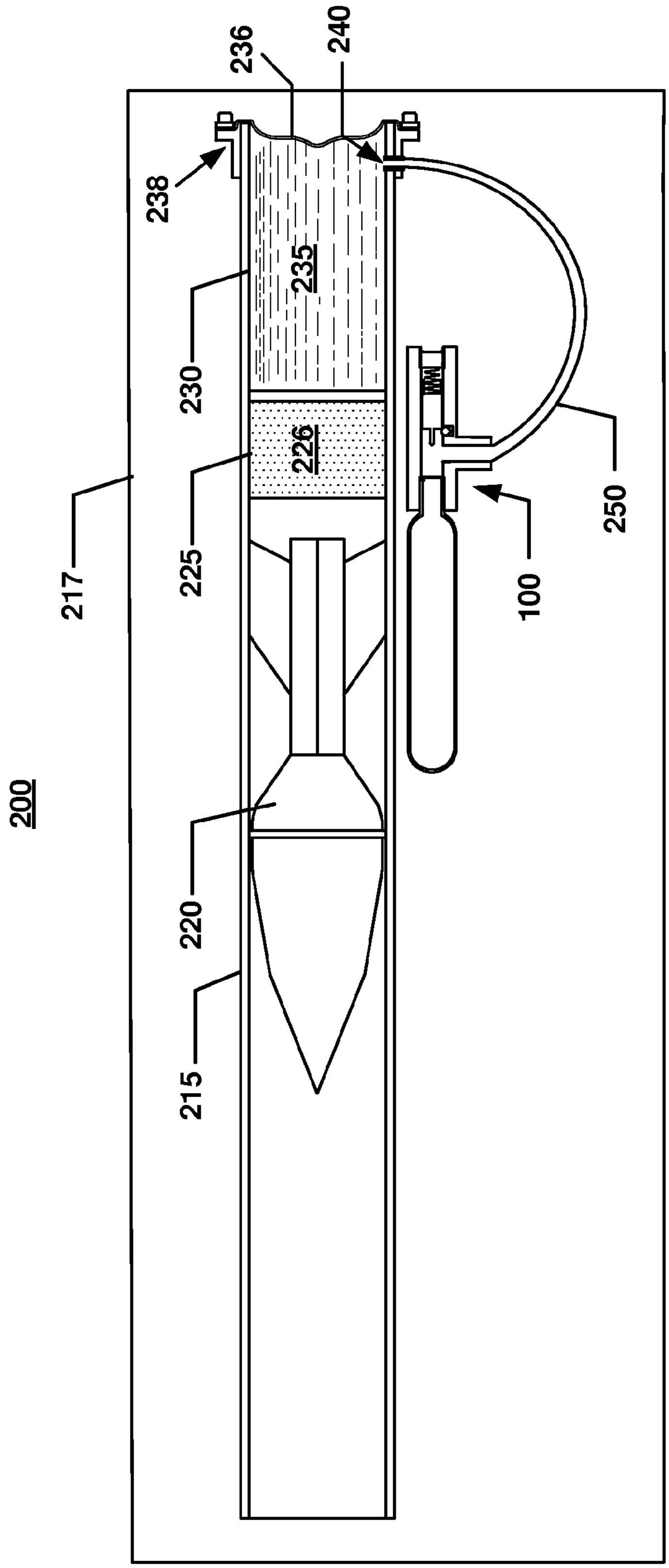


FIG. 2

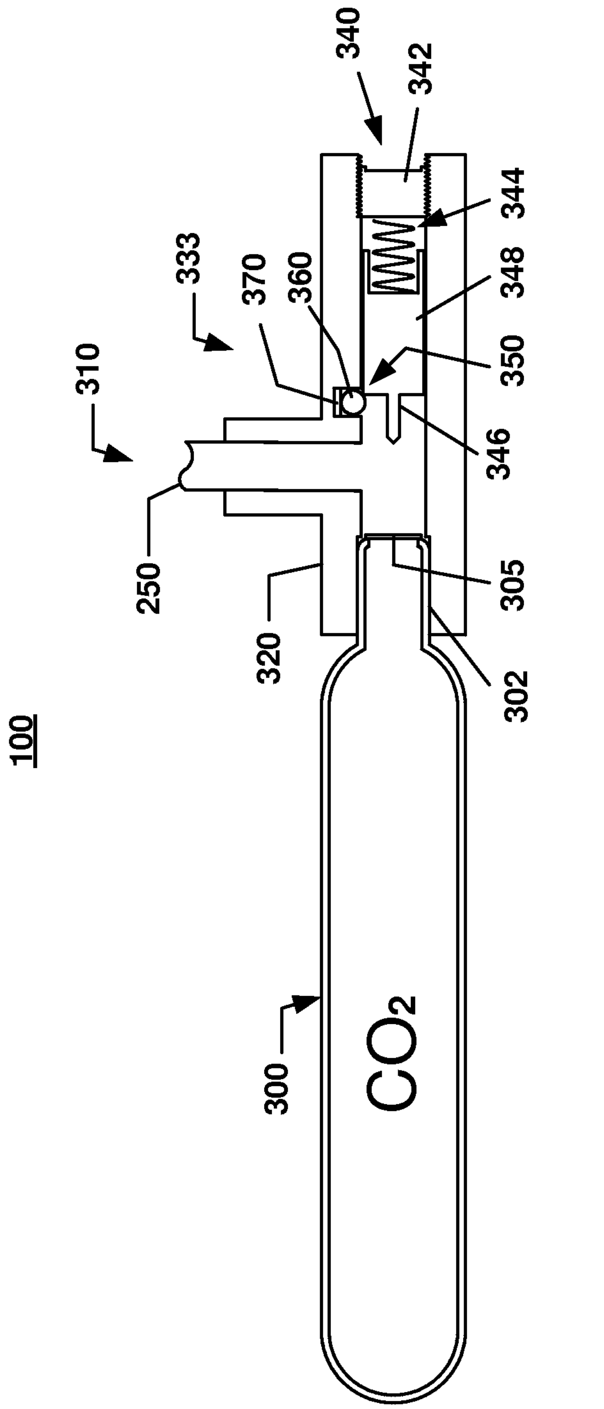

100
340
342
344
348
350
346
333
370
360
310
250
320
305
302
300
CO_2

FIG. 3A

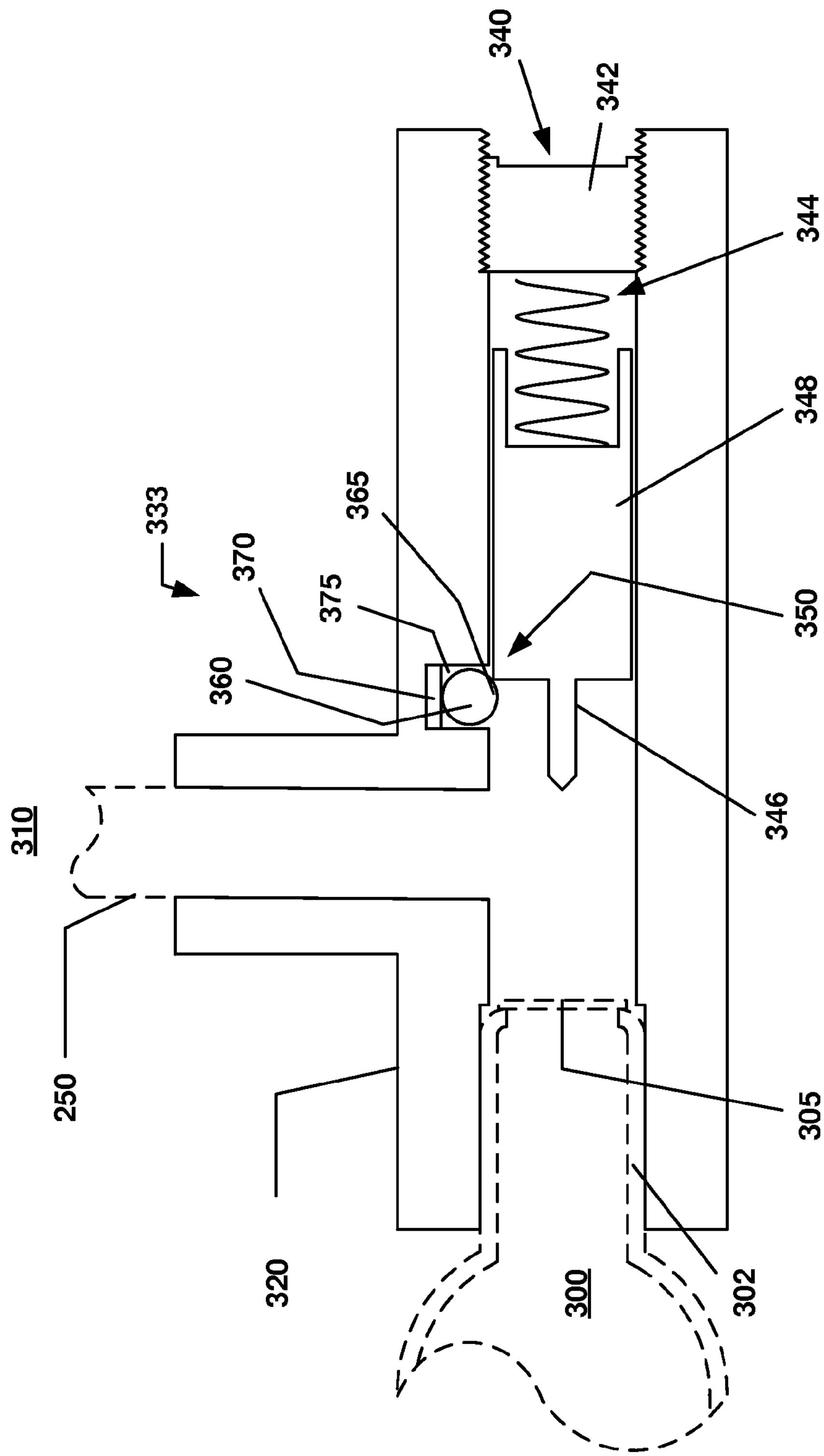

340
342
344
348
333
370
365
375
350
360
346
310
250
305
320
300
302

FIG. 3B

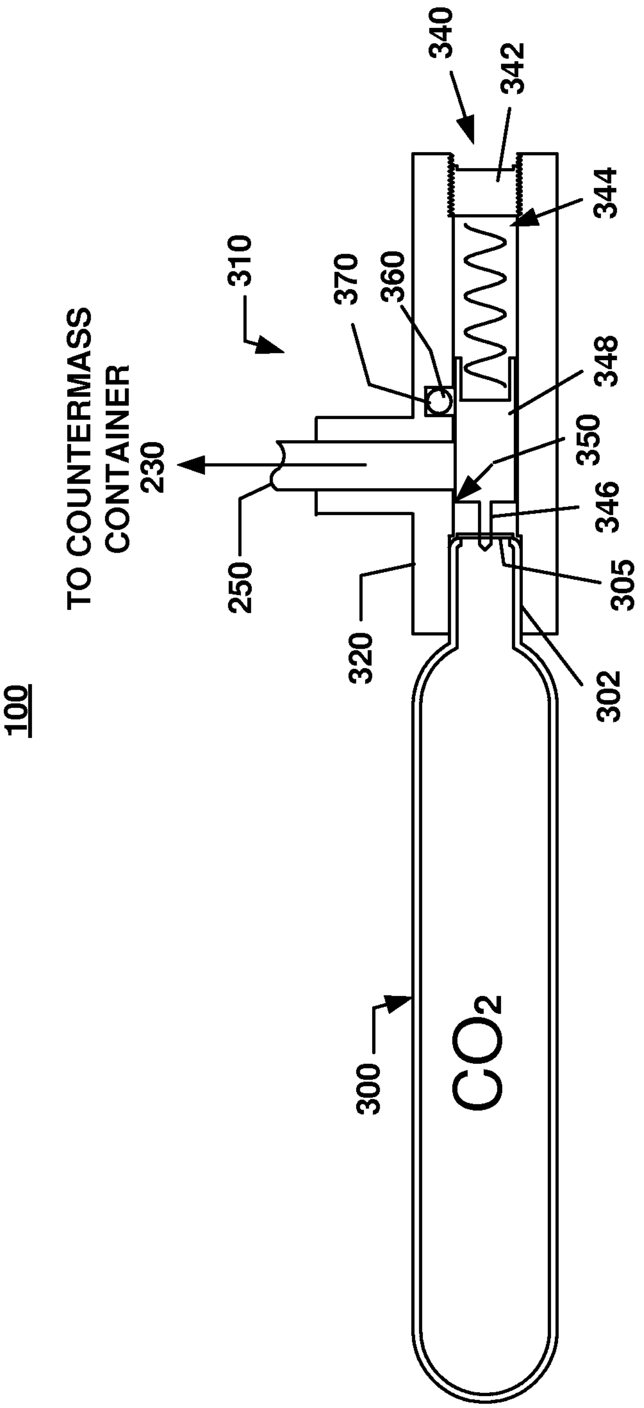

340
342
344
310
370
360
348
350
346
305
302
320
250
TO COUNTERMASS CONTAINER 230
100
300
CO2

FIG. 4

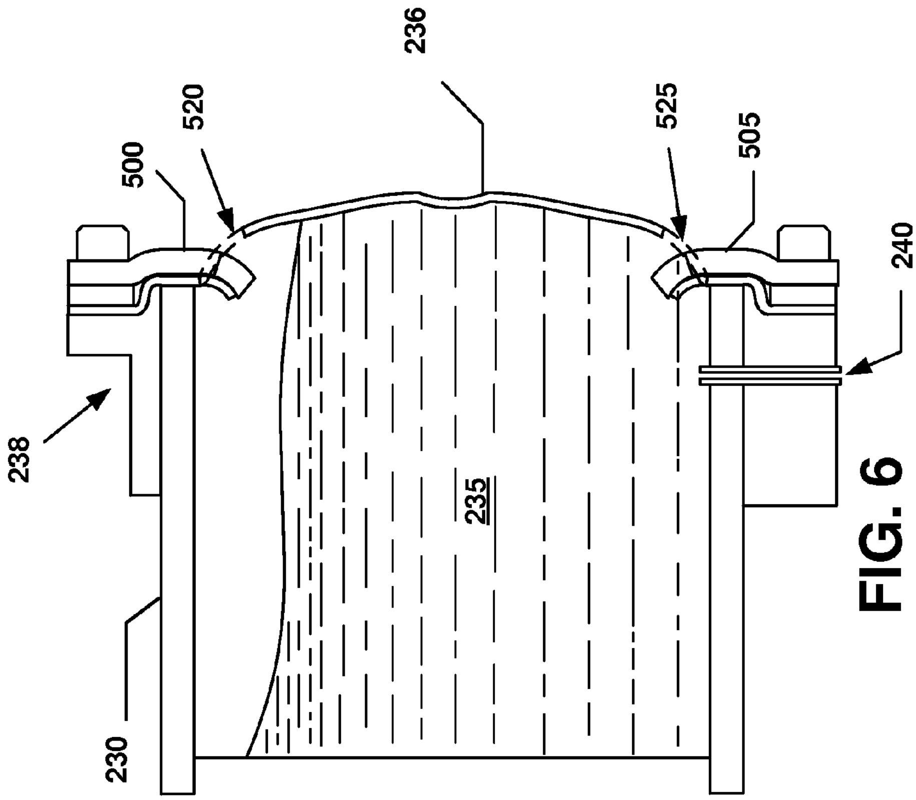

236
520
525
500
505
240
238
235
230

FIG. 6

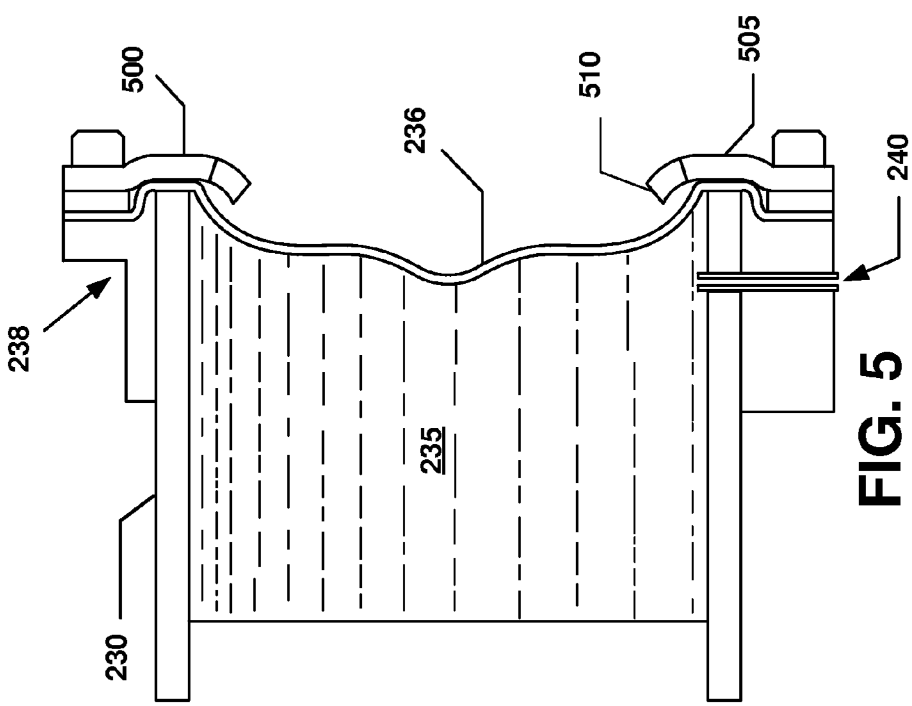

500
510
505
236
240
238
235
230

FIG. 5

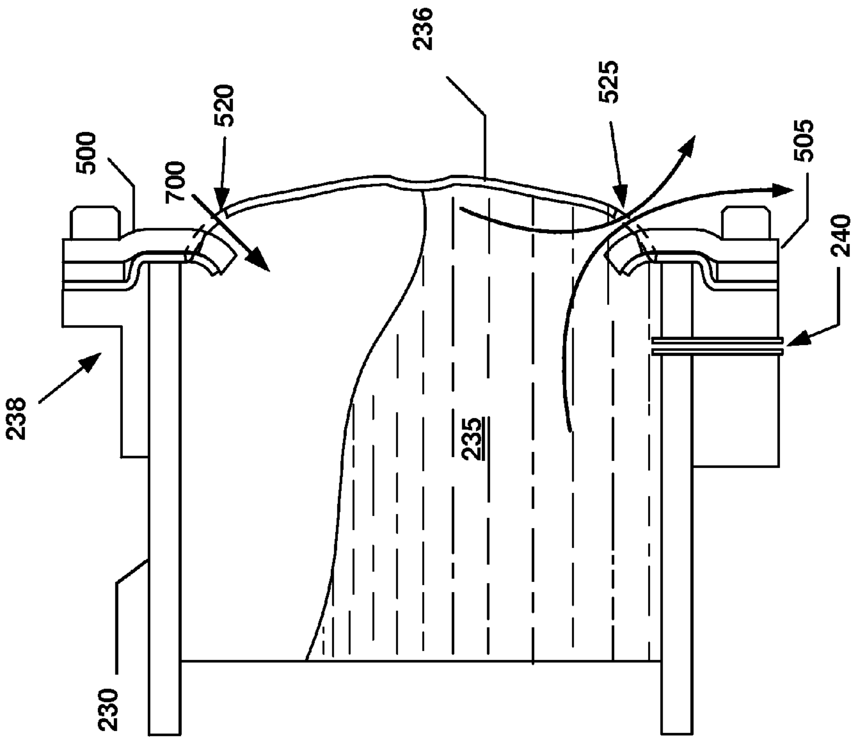


FIG. 7

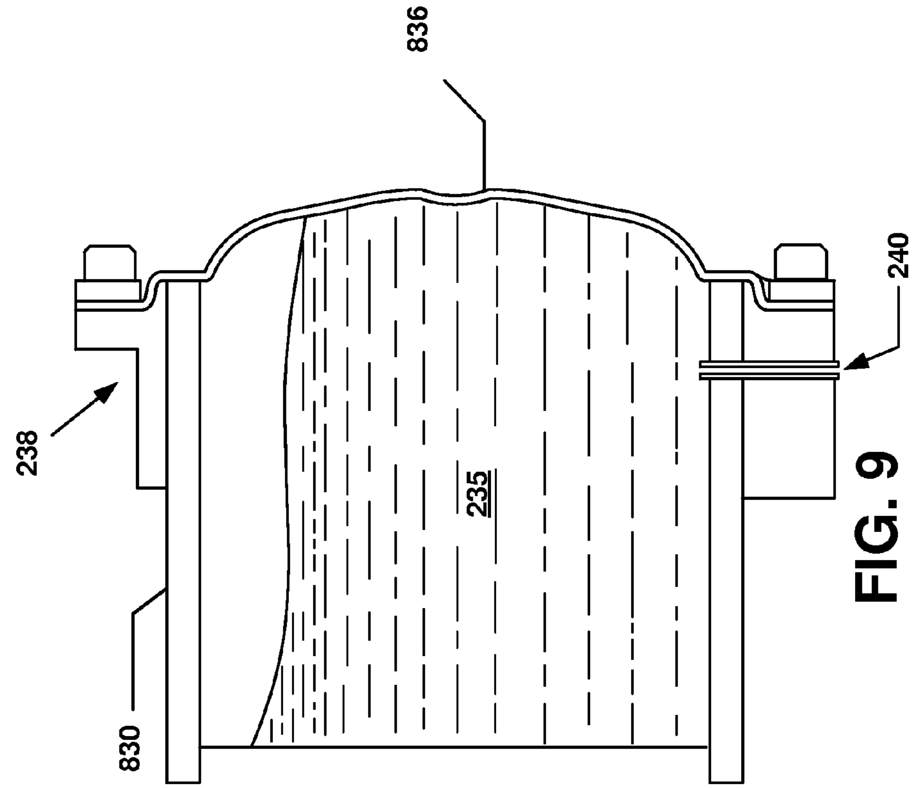


FIG. 9

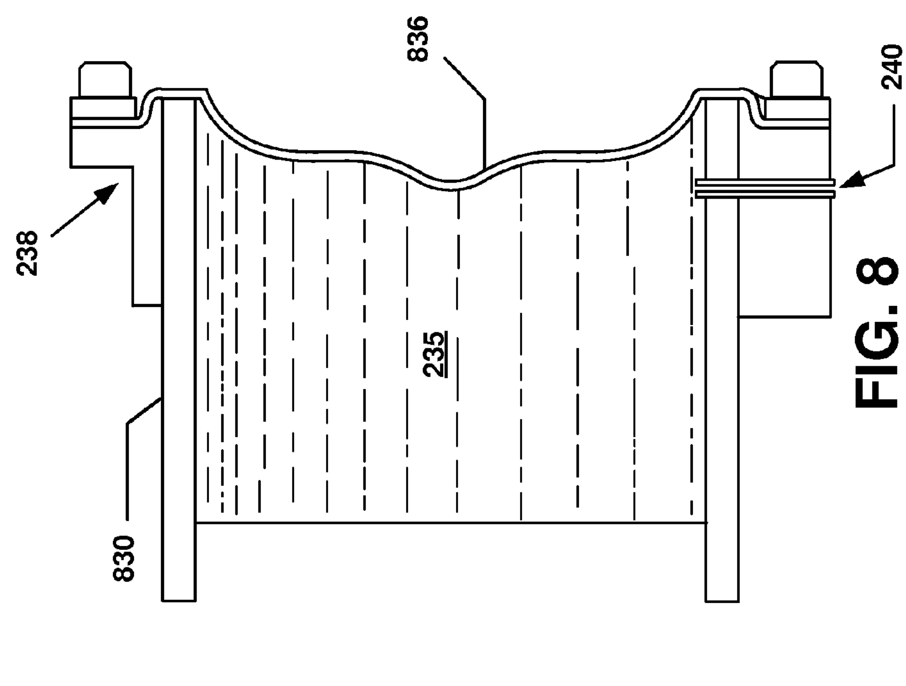


FIG. 8

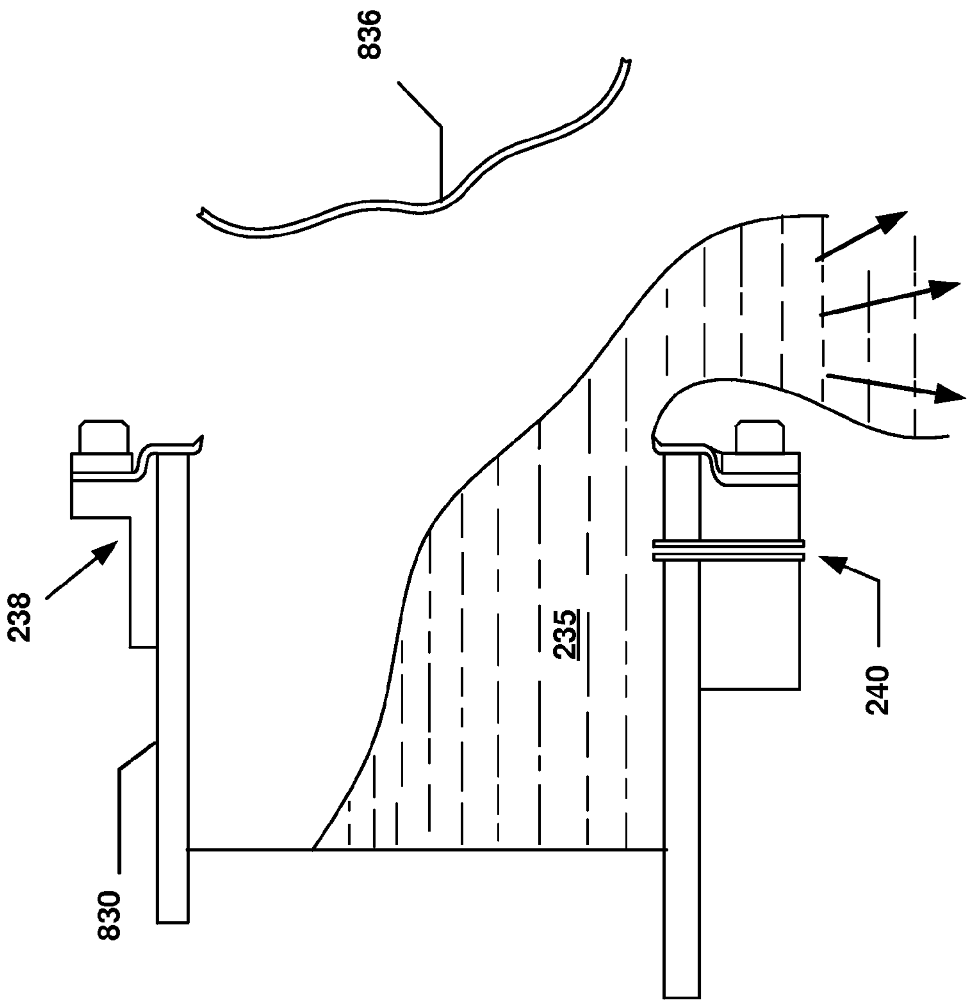


FIG. 10

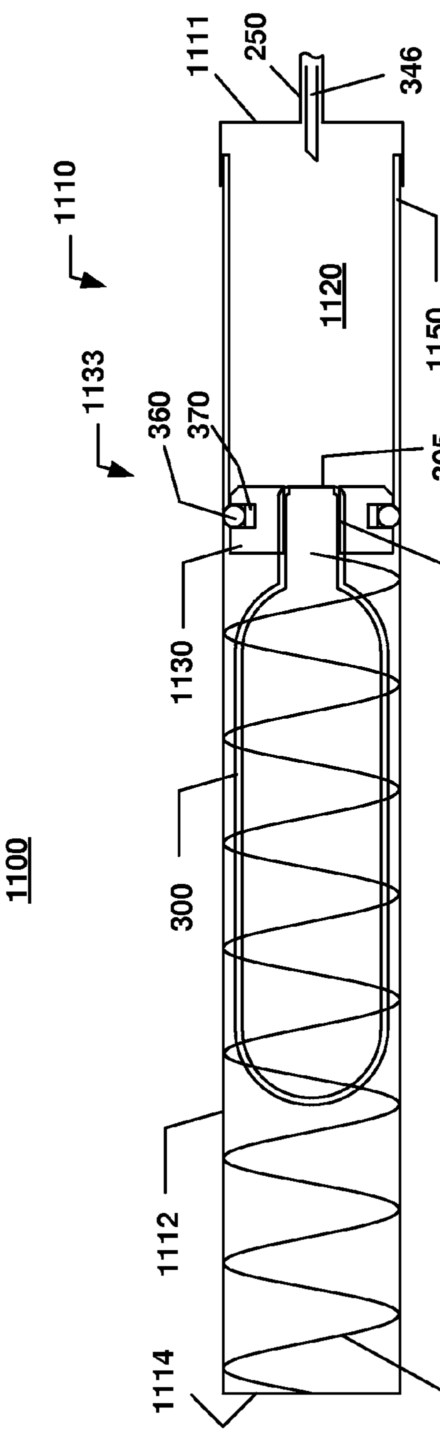

1100
1110
1111
250
346
1120
1150
1133
360
370
305
302
1130
300
1112
1114
1144

FIG. 11

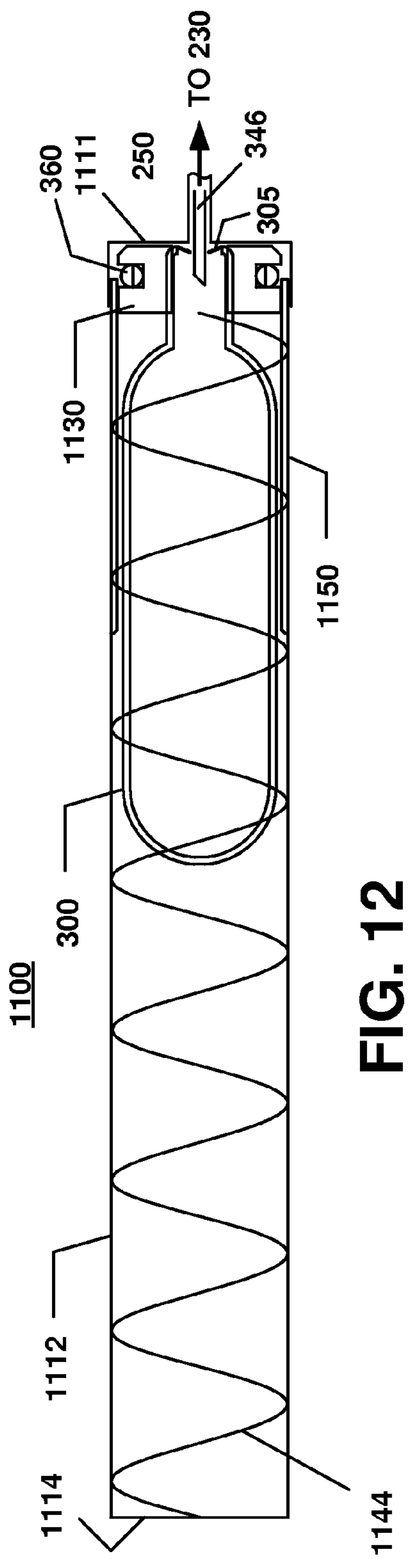

TO 230
360
1111
250
346
305
1130
1150
300
1100
1112
1114
1144

FIG. 12

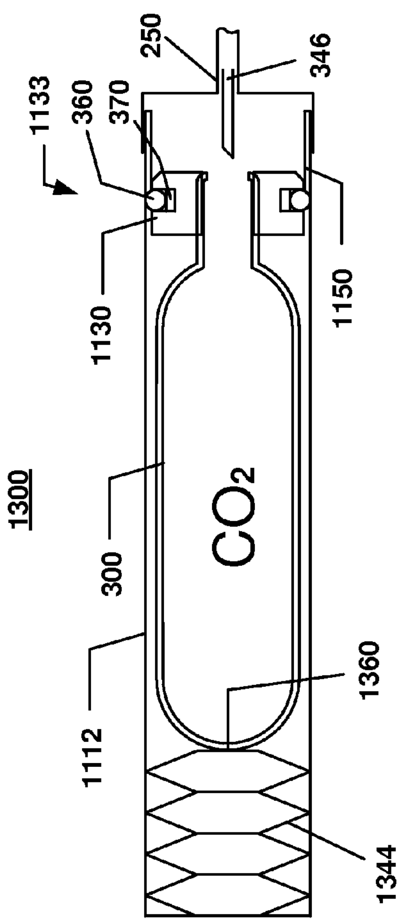

1300
1133
360
370
250
346
1130
1150
300
CO_2
1112
1360
1344

FIG. 13

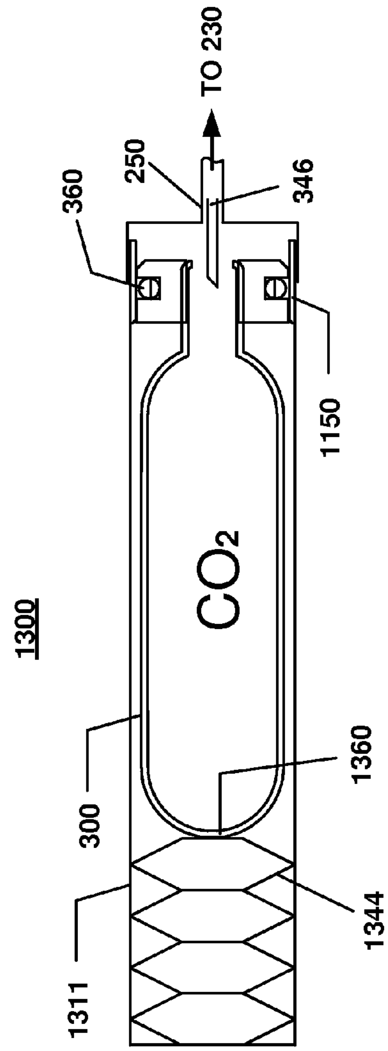

TO 230
360
250
346
1150
1300
CO_2
300
1360
1311
1344

FIG. 14

BLEEDING MECHANISM FOR USE IN A PROPULSION SYSTEM OF A RECOILLESS, INSENSITIVE MUNITION

FEDERAL INTEREST STATEMENT

The inventions described herein may be manufactured, used and licensed by the United States Government for United States Government purposes without payment of any royalties thereon or therefore.

FIELD OF THE INVENTION

The present invention relates in general to the field of weaponry. In particular, the present invention relates to a bleeding mechanism for use in the propulsion system of a recoilless, insensitive munition utilizing a fluidic countermass.

BACKGROUND OF THE INVENTION

The U.S. Department of Defense is currently moving toward the long-term goal of insensitive munition-compliant inventory. The acquisition treatment of insensitive munitions was the subject of a Jan. 26, 1999, memorandum from the Under Secretary of Defense for Acquisition, Technology and Logistics. The overall intent of the memorandum was to focus scarce resources on forward fit incorporation of insensitive munition-compliant technology.

Insensitive munition is expected to save lives and materials. As defined in STANAG 4439, insensitive munitions mean: "Munitions which reliably fulfill their performance, readiness and operational requirements on demand, but which minimize the probability of inadvertent initiation and severity of subsequent collateral damage to weapon platforms, logistics systems and personnel when subjected to unplanned stimuli."

"Unplanned stimuli" include thermal and mechanical impact threats of Fast Cook-Off (FCO), Slow Cook-Off (SCO), Bullet Impact (BI), Fragment Impact (FI), Sympathetic Detonation (SD), Shaped Charge Jet (SCJ), and Spall impact (SI) as presented in MIL-STD-2105B.

The memorandum adds: "All munitions and weapons shall be designed to conform with insensitive munitions (unplanned stimuli) criteria and to use materials consistent with safety and interoperability requirements. Requirements shall be determined during the requirements validation process and shall be kept current throughout the acquisition cycle for all acquisition programs. Interoperability, to include insensitive munitions policies, shall be certified per CJCSI 3170.01 A." "The ultimate objective is to design and field munitions which have no adverse reaction to unplanned stimuli, analogous to Hazard Division 1.6 (TB 700-2/NAVSEAINST 8020.8B/T.O. 11A-1-47/DLAR 8220.1, "Department of Defense Ammunition and Explosives Hazard Classification Procedures")."

While prior efforts to develop an insensitive munition (IM) propulsion system for a recoilless weapon utilizing a countermass presented certain advantages, they still suffered from numerous shortcomings, amongst which are the following:

a. Recoilless weapons often utilize filament wound barrels in order to maximize strength and minimize weight. Because cutting holes in these barrels would compromise their integrity, the common practice of venting the propulsion system will not be feasible.

b. The utilization of heat sensitive materials to allow the countermass to drain will be difficult because the countermass behaves as a heat sink, preventing the heat sensitive materials from heating durng a cook off.

c. Other features located within the barrel relied on heat to activate, but the percussion cap located on the surface of the barrel is exposed to the heat much earlier than the in-barrel features.

d. Some of these features utilized eutectic alloys to solder mechanical components. While eutectic alloys have an excellent temperature response, the processes to solder these components lack an industrial base for full rate production. Additionally, the eutectic alloy is costly.

According to United States Code, Title 10, Chapter 141, Section 2389—Ensuring safety regarding Insensitive Munitions (IM)—the Secretary of Defense shall ensure, to the extent practicable, that munitions under development of procurement are safe throughout development and fielding when subject to unplanned stimuli.

Two tests are used to simulate munitions exposed to a fire: Slow Cook Off (SCO) and Fast Cook Off (FCC). In SCO, munitions in packaged configuration are heated at a rate of 6° C./hour until it reacts. In FCC, munitions are engulfed in a flame of at least 1700° C. until it reacts. It is desirable for the reaction to be limited to no more than burning (Type 5 reaction). A detonation is not acceptable (Type 1 reaction).

Recoilless weapons operate by using expanding propellant gases to propel a projectile forward and a mass backwards in order to minimize recoil. Some recoilless weapons utilize a fluid as a countermass, which is propelled backwards in order to minimize the hazard of the back blast to allow for firing from enclosure.

When tested for IM, the propulsion systems of the recoilless weapons sometimes ignite, launching the projectile, which fails IM requirements with a Type 4 deflagration. The warhead may become armed and detonate, which fails IM with a Type 1 detonation. It has been found that the removal of the countermass will often prevent the projectile from leaving the barrel and arming.

It would therefore be desirable to provide a bleeding mechanism for use in the propulsion system of a recoilless, insensitive munition (IM) utilizing a utilizing a fluidic countermass that addresses the foregoing problems associated with convention IM systems. The bleeding mechanism would be activated by excess heat, and as a result, it would cause the countermass container to rupture. Once ruptured, the countermass fluid will drain out. Without a countermass, the propulsion system will no longer function. The need for such a bleeding mechanism has heretofore remained unsatisfied.

SUMMARY OF THE INVENTION

The present invention satisfies this need and describes a novel bleeding mechanism for use in the propulsion system of a recoilless, insensitive munition (IM) utilizing a utilizing a fluidic countermass.

According to a preferred embodiment, the present bleeding mechanism utilizes a firing pin or a similar device which is held in place by any one or more of:

a. A heat sensitive material that bonds to a firing pin.

b. A heat sensitive material that blocks the movement of the firing pin.

c. A mechanical device that locks the firing pin in position until a heat sensitive material unlocks the device.

The insensitive munition generally includes a tubular barrel within which a projectile (or warhead) is housed. A propulsion system and a liquid filled countermass container are also housed within the barrel, behind the projectile.

The present bleeding mechanism can either form part of the insensitive munition, or it can be externally and separately connected to the insensitive munition. In either design, the bleeding mechanism is connected to an inlet of the countermass container.

When the insensitive munition is exposed to an unplanned stimulus, such as heat, the reaction of a heat sensitive material within the bleeding mechanism allows a firing pin to be released and to rupture a cartridge seal. The cartridge may be filled with a compressed gas or a compound that releases gas when exposed to heat. The released gas may be any suitable gas such as carbon dioxide, nitrogen, and helium. The compound may be a material that outgases when heated, such as sodium bicarbonate, potassium carbonate, and potassium bicarbonate, or an energetic material that combusts to generate gas.

The compressed gas from the cartridge will flow into the countermass container and may:

- a. Rupture the container, allowing or forcing the fluid out of the countermass container.
- b. Force the fluid within the countermass container to travel to either:
  - i. the propulsion system in order to achieve a Type 6, no reaction; or
  - ii. the warhead to assist in an IM feature used to improve the warhead IM performance.

With the fluid removed from the countermass container, if the propulsion system activates, the projectile will remain within the insensitive munition.

If the bleeding mechanism is located outside the barrel it will be readily exposed to the heat of a cook off. The filament wound barrel of the weapon is a good insulator and restricts the flow of heat to the heat sensitive device. The positioning of the device outside the weapon allows it to react to the thermal stimuli in a timely manner.

More specifically, the present bleeding mechanism utilizes a heat sensitive material that may include any one or more of the following designs:

- a. Low melting temperature materials including but not limited to alloys, ionomer plastics, waxes, or salts.
- b. Low boiling temperature materials in an ampoule.
- c. Shape memory materials that deform, unlocking the locking mechanism.
- d. Reactive materials initiated by heat.
- e. Commercially available indium, bismuth, lead, and tin-based alloys.
- f. Commercially available plastics, such as polyethylene and ionomers.
- g. Waxes.
- h. Soluble salts used inside ballistic material to provide cooling during a cook off. Reference is made to the following web site: http://www.rockyresearch.com/news/RR_News_Archives_022411. pdf
- i. Alcohol filled ampoules used in automatic fire sprinkler heads.
- j. Shape Memory alloys and shape memory composites.
- k. Slow burning propellant (base bleed material), slow burning pyrotechnics.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other features of the present invention and the manner of attaining them, will become apparent, and the invention itself will be best understood, by reference to the following description and the accompanying drawings:

FIG. **1** is a representation of a conventional recoilless, insensitive munition;

FIG. **2** is a representation of an insensitive munition that is provided with a bleeding mechanism according to a preferred embodiment of the present invention;

FIG. **3** is comprised of FIGS. **3**A and **3**B, wherein FIG. **3**A is an enlarged representation of the bleeding mechanism of FIG. **2**, shown in a deactivated state, and FIG. **3**B is a greatly enlarged view of a bleeding controller that forms part of the bleeding mechanism of FIG. **3**A;

FIG. **4** is an enlarged representation of the bleeding mechanism of FIGS. **2** and **3**, shown in an activated state;

FIGS. **5**, **6**, **7** are representations of a first embodiment of a countermass container forming part of the insensitive munition of FIG. **2**, illustrating progressive stages before and after the bleeding mechanism of FIG. **4** is activated;

FIGS. **8**, **9**, **10** are representations of a second embodiment of the countermass container of the insensitive munition of FIG. **2**, illustrating progressive states before and after the bleeding mechanism of FIG. **4** is activated;

FIG. **11** is a representation of another embodiment of the bleeding mechanism of FIG. **2**, shown in a deactivated state;

FIG. **12** is a representation of the bleeding mechanism of FIG. **11**, shown in an activated state;

FIG. **13** is a representation of yet another embodiment of the bleeding mechanism of FIG. **2**, shown in a deactivated state; and

FIG. **14** is a representation of the bleeding mechanism of FIG. **13**, shown in an activated state.

Similar numerals refer to similar elements in the drawings. It should be understood that the sizes of the different components in the figures are not necessarily in exact proportion or to scale, and are shown for visual clarity and for the purpose of explanation.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. **1** is a representation of a conventional recoilless, insensitive munition **10** having a tubular barrel or launch tube **15**. A warhead or projectile **20** is placed within the launch tube **15**. A propulsion system **25** and a liquid filled countermass container **30** are also housed within the launch tube **15**, behind the projectile **20**.

Since the insensitive munition **10** often utilizes a filament wound barrel **15** in order to maximize strength and minimize weight, cutting holes in the barrel **15** to allow the countermass **35**, within the countermass container **30**, will compromise the integrity of the insensitive munition **10**, and is therefore neither feasible nor recommended.

Wherefore, the present invention generally describes a novel bleeding mechanism **100** for use as an external auxiliary to an insensitive munition **200**, for example as part of a storage unit or container **217**, as illustrated in FIG. **2**. Since the bleeding mechanism **100** is located externally relative to the barrel **215**, it is not shielded from the heat of the cook off.

Alternatively, the bleeding mechanism **100** can form an integral part of the insensitive munition **200**, and could be secured externally, to a barrel **215**, or it could be placed internally relative to the barrel **215** of the insensitive munition **200**.

The recoilless insensitive munition **200** further includes a projectile **220**, a propulsion system **225** that contains a propellant **226**, and a countermass container **230** that contains a fluidic countermass **235**.

The countermass container **230** is generally cylindrically shaped and is open at one end thereof. When the countermass container **230** is filled with the fluidic countermass **235**, its open end is sealed with an elastic countermass cover **236**. The countermass cover **236** is secured to the barrel **215** by means of a countermass cover retention feature **238** that is either known or available, and thus it will not be described in detail.

The countermass cover **236** is preferably made of elastomeric material, such as Polyethylene, in order to allow for expansion under pressure. The fluidic countermass **235** is preferably a saline solution, but could be any other suitable solution, including but not limited to Iron oxide solution, plastic confetti.

The countermass container **230** also includes a compressed gas inlet **240** that is connected to an inlet tube **250**, for allowing the compressed air to enter, through the inlet **240** to the countermass container **230**, via the inlet tube **250**, as it will be explained later in greater detail. The inlet tube **250** forms part of the bleeding mechanism **100**.

FIGS. **3**A and **3**B illustrate the bleeding mechanism **100** of FIG. **2**, shown in a deactivated state. The bleeding mechanism **100** generally includes a source of pressurized fluid, such as a cylinder or a canister **300** of pressurized carbon dioxide, CO_2. The cylinder **300** includes a neck **302** that is hermetically sealed with a seal **305**. In this state, the seal **305** is still unruptured and maintains pressure within the cylinder **300**.

The bleeding mechanism **100** further includes a bleeding controller **310** that controls the flow of the gas to the countermass container **230**, as illustrated in FIGS. **2**, **5**, **6**, and **7**. The bleeding controller **310** generally includes a generally cylindrically shaped bleeding chamber **320** that retains the neck **302** of the cylinder **300** at one of its ends. The bleeding chamber **310** further retains the tube **250**, and provides a path for the gas that escapes from the cylinder **300**.

The opposite end of the bleeding controller **310** houses a slidable firing pin assembly **340**. The firing pin assembly **340** includes a firing pin **346** that protrudes axially, in the direction of the seal **305**, within the bleeding chamber **310**. The firing pin assembly **340** further includes a support body **348** that supports the firing pin **346**, and that is capable of sliding axially toward the seal **305**, as it will be explained in connection with FIG. **4**.

Under normal conditions, that is in the absence of an unplanned stimulus, the support body **348** compresses a spring **344** against a base **342**. This compression state is maintained by means of a locking mechanism **333**, as long as the thermal and other conditions remain within predefined normal parameters.

According to this preferred embodiment, the locking mechanism **333** includes a The locking feature such as a ball, and a heat sensitive alloy **370**. In this compression state, the heat sensitive alloy **370** is placed within a crevice, indentation, or deformation **375** within the inner surface of the bleeding chamber **320**. The locking ball **360** is placed against the alloy **370** and retains it in place.

The heat sensitive material **370** can be a low melting point eutectic solder, such as an Indium/tin alloy. Since a small amount of the eutectic solder (or alloy) is needed, the cost of the locking mechanism **333** will not be significantly affected. The eutectic alloy **370** has an ideal thermal response to heat, melting completely at a precise temperature. The present invention utilizes the eutectic alloy **370** as a secondary feature in the locking mechanism **333**, allowing the higher mechanical properties of the steel ball **360** to hold back the firing pin **346**.

The locking ball **360** is preferably spherically shaped. The locking ball **360** can be made of any suitable material, including but not limited to stainless steel. The crevice **375** is shaped and dimensioned so that in the compressed state, as it accommodates the unmelted alloy **370**, a portion **365** of the locking ball **360** protrudes outwardly from the crevice **375**, so as to engage an edge **350** of the support body **348**. As a result, the locking mechanism **333** retains the firing pin assembly **340** in a locked position, with the spring **344** compressed against the base **342**.

Referring now to FIG. **4**, it illustrates the bleeding mechanism **100** in an activated state. If and when the environmental conditions change, that is when the insensitive munition **200** is exposed to an unplanned stimulus, for example, if the thermal conditions surrounding the insensitive **200** change, such as when the heat sensitive alloy **370** is exposed to elevated temperatures, for example, approximately 250° F., then the heat sensitive alloy **370** melts, causing the locking ball **360** to recede within the crevice **375**. The recession of the locking ball **360** unlocks the locking mechanism **333** by releasing the edge **350** of the support body **348** from the wedging of the ball **360**, and causes the spring **344** to expand, forcing the support body **348** and the firing pin **346** forward toward the seal **305**, rupturing it.

As the seal **305** is ruptured, the pressurized gas within the cylinder **300** expands and escapes, through the ruptured seal **305**, the bleeding chamber **320**, and the tube **250**, to the countermass container **230**.

FIGS. **5**, **6**, and **7** the progressive stages of the countermass container **230** before and after the bleeding mechanism **100** has been activated.

FIG. **5** illustrates the countermass container **230** when the bleeding mechanism **100** has not been activated (FIGS. **2**, 3A, 3B). In this particular preferred embodiment, the countermass container **230** is provided with one or more openers **500**, **505**, that are retained by the countermass cover retention feature **238**. Each of the openers **500**, **505** has a sharp edge **510** that is positioned in close proximity to the countermass cover **236**, along the periphery of the countermass container **230**.

When the bleeding mechanism **100** is not been activated, the countermass cover **236** is in a “deflated” or undeployed state, and the sharp edge **510** of the openers **500**, **505**, remains at a safe distance from the countermass cover **236** so as not to puncture it.

FIGS. **6** and **7** illustrate the countermass container **230** when the bleeding mechanism **100** has been activated (FIG. **4**). As the gas from the cylinder **300** is injected into the countermass container **230** under pressure, it causes the countermass cover **236** to be deployed and to be ruptured by the openers **500**, **505**, at one or a plurality of ruptures or tears **520**, **525**, respectively.

As more clearly illustrated in FIG. **7**, input air **700**, at atmospheric pressure enters the countermass container **236** through the rupture **520**, and further forces the fluid countermass **235** to drain through the rupture **525**, until the countermass container **230** is emptied of its fluid content **235**. Consequently, the propulsion system **226** will be disabled.

FIGS. **8**, **9**, and **10** illustrate another embodiment of the countermass container of the insensitive munition of FIG. **2**, showing progressive states after the bleeding mechanism **100** of FIG. **4** has been activated. The countermass container **830** of FIGS. **8**, **9**, and **10** is similar in design, construction, and operation to the countermass container **230** of FIGS. **5**, **6**, and **7**, with the exception that the countermass container **830** does not include the opener **500**, **505** of FIGS. **5**, **6**, and **7**.

Rather, the countermass cover **836** of the countermass container **830** is made of a readily rupturable material, such as for example, polyethylene, that ruptures when the countermass cover **836** is deployed under pressure from the injected gas, as explained earlier.

FIG. **11** illustrates another bleeding mechanism **1100**, shown in a deactivated state. The bleeding mechanism **1100** includes a bleeding controller **1110** that controls the flow of the gas to the countermass container **230**. The bleeding controller **1110** generally includes a generally cylindrically shaped bleeding chamber **1120** and a sliding assembly **1130**.

The sliding assembly **1130** retains the neck **302** of the cylinder **300** in a slidable relationship relative to the housing **1112**. The bleeding chamber **310** provides a path for the gas that escapes from the cylinder **300**.

In this embodiment, the firing pin **346** is secured to a fixed structure **1111**, and the pressurized gas cylinder **300** is retained in a spring loaded position, against a housing **1112**.

To this end, the body of the cylinder **3300** is surrounded by a spring **1144** that is compressed against the bottom side **1114**. This compressed position is maintained by means of a locking mechanism **1133** that is similar in function to that of the locking mechanism **333**.

The locking mechanism **1133** includes a sliding assembly **1130** that surrounds, and that is tightly secured to the neck **302** of the cylinder **300**. The sliding assembly **1130** includes an indentation within which the heat sensitive alloy **370** is housed. The locking ball **360** is inserted within the indentation, atop the heat sensitive alloy **370**, such that a portion of the locking ball **360** protrudes from the indentation.

The protruding portion of the locking ball **360** engages a sleeve **1150** that is affixed to the housing **1112**. As a result, the engagement of the sleeve **1150** and the locking ball **360** retains the spring in a compressed position, holding the cylinder **300** at a distance from the firing pin **346**.

FIG. **12** is a representation of the bleeding mechanism **1100** of FIG. **11**, shown in an activated state. As explained earlier, when the insensitive munition **200** is exposed to excessive heat, the heat sensitive alloy **370** melts, causing the locking ball **360** to be depressed within the indentation of the sliding assembly **1130**.

In turn, the sleeve **1150** disengages from the locking bail **360**, which allows the sliding assembly **1130**, along with the cylinder **300** to be propelled forward toward the firing pin **346**. As a result, the firing pin **346** punctures the seal **305** of the cylinder **300**, resulting in the escape of the gas from within the cylinder **300** to the countermass container **230**, through the tube **250**, as described earlier.

FIGS. **13**, **14** illustrate another bleeding mechanism **1300** that is similar in design, construction, and operation to the bleeding mechanism **1100** of FIGS. **11**, **12**, with the single exception that it uses a different type of spring. The bleeding mechanism **1300** uses a Bellville type spring **1344** that engages the bottom **1360** of the cylinder **300**. The stacked Bellville (disc) spring **1344** provides high force in a compact form.

It should be understood that other modifications might be made to the present bleeding mechanism **100** without departing from the spirit and scope of the invention. For example, the present invention may be applied to single use recoilless rifles utilizing a liquid countermass, and for the IAM (Individual Assault Munition).

Furthermore, all examples and conditional language recited herein are principally intended expressly to be only for pedagogical purposes to aid the reader in understanding the principles of the invention and the concepts contributed by the inventor(s) to furthering the art, and are to be construed as being without limitation to such specifically recited examples and conditions.

Moreover, all statements herein reciting principles, aspects, and embodiments of the invention, as well as specific examples thereof, are intended to encompass both chemical and functional equivalents thereof. Additionally, it is intended that such equivalents include both currently known equivalents as well as equivalents developed in the future, i.e., any elements developed that perform the same function, regardless of composition.

What is claimed is:

1. A bleeding mechanism for use with an insensitive munition utilizing a fluidic countermass within a countermass container, the bleeding mechanism comprising:

a canister having a seal and filled with a gas under pressure;

a bleeding controller that is fluidly connected to the canister and to the countermass container;

wherein one end of the countermass container is sealed with a countermass cover; and

wherein when the bleeding controller is exposed to an unplanned stimulus, the bleeding controller ruptures the seal of the canister, causing the gas within the canister to be released to the countermass container, resulting in the rupture of the countermass cover, and allowing the fluidic countermass to be drained from the countermass container in order to deactivate the insensitive munition.

2. The bleeding mechanism of claim **1**, wherein the gas under pressure in the canister is selected from a group consisting essentially of: carbon dioxide, a non-flammable, and a non-hazardous gas.

3. The bleeding mechanism of claim **1**, wherein the canister seal is made of a material that is selected from a group consisting essentially of: polyethylene, a plastic material, a metal, a composite, and glass.

4. The bleeding mechanism of claim **1**, wherein the bleeding controller includes a bleeding chamber that retains a part of the canister, and that provides an escape path for the gas that is released from the canister.

5. The bleeding mechanism of claim **4**, wherein the bleeding chamber further retains one end of a conduit; and

wherein the other end of the conduit extends, and is secured to the countermass container, for extending the gas escape path from the bleeding chamber to the countermass container.

6. The bleeding mechanism of claim **4**, wherein the bleeding controller further includes a locking mechanism and a firing pin assembly; and

wherein if the bleeding controller is not exposed to the unplanned stimulus, the locking mechanism locks the firing pin assembly in position at a safe distance from the canister seal.

7. The bleeding mechanism of claim **6**, wherein if the bleeding controller is exposed to the unplanned stimulus, the locking mechanism unlocks the pin assembly, causing the firing pin assembly to puncture the canister seal.

8. The bleeding mechanism of claim **7**, wherein the bleeding chamber includes an indentation within an inner wall; and

wherein the locking mechanism includes a heat sensitive material that is housed within the indentation, and a locking feature that is seated atop the heat sensitive material, and that is housed in part within the indentation.

9. The bleeding mechanism of claim **8**, an exposed part of the locking feature engages the firing pin assembly for locking the firing pin assembly in position.

10. The bleeding mechanism of claim **9**, wherein when the bleeding controller is exposed to the unplanned stimulus, the heat sensitive material melts, causing the locking feature to disengage from the firing pin assembly, and further causing the firing pin assembly to propel toward and to puncture the canister seal.

11. The bleeding mechanism of claim **8**, wherein the locking feature includes a locking ball.

12. The bleeding mechanism of claim **6**, wherein the firing pin assembly includes a slidable firing pin and an elastic element.

13. The bleeding mechanism of claim **12**, wherein the elastic element includes a spring.

14. The bleeding mechanism of claim **1**, wherein the bleeding controller includes a bleeding chamber, a sliding assembly, and a firing pin.

15. The bleeding mechanism of claim **14**, wherein the sliding assembly retains a part of the cylinder; and

wherein the bleeding chamber provides a path for the gas that escapes from the canister.

16. The bleeding mechanism of claim **15**, wherein the bleeding controller further includes a sleeve that is secured to a housing, intermediate the sliding assembly and the firing pin.

17. The bleeding mechanism of claim **16**, wherein if the bleeding controller is exposed to the unplanned stimulus, the locking mechanism unlocks the sliding assembly, causing the firing pin assembly to puncture the canister seal.

18. The bleeding mechanism of claim **1**, wherein the unplanned stimulus includes any one or more of: excess thermal or mechanical impact threats of Fast Cook-Off (FCO) and Slow Cook-Off (SCO).

19. A bleeding mechanism for use with an insensitive munition utilizing a fluidic countermass within a countermass container, the bleeding mechanism comprising:

a canister having a seal and containing a gas generating compound;

a bleeding controller that is fluidly connected to the canister and to the countermass container;

wherein one end of the countermass container is sealed with a countermass cover;

wherein when the bleeding controller is exposed to an unplanned stimulus, the bleeding controller ruptures the seal of the canister, causing the gas generating compound to generate gas within the canister; and

wherein the generated gas is released to the countermass container, resulting in the rupture of the countermass cover, and allowing the fluidic countermass to be drained from the countermass container in order to deactivate the insensitive munition.

20. The bleeding mechanism of claim **19**, wherein the generated gas is selected from a group consisting essentially of: carbon dioxide, a non-flammable, and a non-hazardous gas.

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